

REMARKS

This is a full and timely response to the final Official Action mailed December 18, 2003 (Paper No. 12022003). Reconsideration of the application in light of the following remarks is respectfully requested.

Pending claims 8-21, 24, 46 and 47 are withdrawn subject to a restriction requirement. Thus, claims 1-7, 22, 23 and 25-45 are currently pending for the Examiner's consideration.

In the outstanding Office Action, the Examiner indicated that claim 36 would be allowable if rewritten as an independent claim and if the rejection under 35 U.S.C. § 112, first paragraph, could be overcome. Applicant wishes to thank the Examiner for this indication of allowable subject matter. Accordingly, claim 36 has been amended and rewritten as an independent claim containing verbatim all the recitations of previous base claim 35. Additionally, Applicant believes that the following remarks will overcome the outstanding 35 U.S.C. § 112, first paragraph, rejection. Consequently, claim 36 should be in condition for allowance following entry of this amendment.

Entry of this amendment is proper under 37 C.F.R. § 1.116 and is hereby requested. The only amendments made by the present paper are to claims 36 and 45. The amendment to claim 36 has just been described and merely makes claim 36 an independent claim without changing any recitations of claim 36 as previously presented. The amendment to claim 45 is to correct an obvious error noted by the Examiner under 35 U.S.C. § 112, second paragraph.

Consequently, the present amendment makes only those changes necessary to place the application in better form as suggested and directed by the Examiner. The amendment

does not raise new issues requiring further search or consideration. Therefore, entry of the present amendment is proper under 37 C.F.R. § 116 and is hereby requested.

In the final Office Action, claims 46 and 47 were declared to be drawn to a non-elected invention and were withdrawn from consideration. Applicant respectfully traverses this withdrawal of claims 46 and 47.

Claims 46 and 47 and drawn to the same invention as recited in pending claims 1 and 26, respectively. Claims 1 and 26 each recite a process and claims 46 and 47 recite systems for performing the processes of claims 1 and 26, respectively.

Applicant refers to the MPEP § 806.05(e). "Process and apparatus for its practice can be shown to be distinct inventions, if either or both of the following can be shown: (A) that the process as claimed can be practiced by another materially different apparatus or by hand; or (B) that the apparatus as claimed can be used to practice another and materially different process." The final Office Action fails to make either of these showings as would be required to properly support a restriction of claims 46 and 47 from the group of elected claims.

More importantly, MPEP § 806.05(e) goes on to expressly state that: "If the apparatus claims include a claim to 'means' for practicing the process, the claim is a linking claim and must be examined with the elected invention." (emphasis added). In the present case, claims 46 and 47 are "means" claims reciting means for performing the method steps recited in claims 1 and 26, respectively. Thus, according to the MPEP, claims 46 and 47 "must" be examined and cannot be withdrawn from consideration. Accordingly, Applicant hereby requests examination of claims 46 and 47.

Next, the final Office Action rejects claims 1-7, 22, 23 and 25-45 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. According to the final Office Action, the specification as originally filed failed to mention deposition of a “uniform” layer of photo-activatable building material and, thus, the recitation of a uniform layer of photo-activatable building material is “new matter” and a violation of § 112, first paragraph. Applicant respectfully traverses this rejection.

Applicant’s specification as originally filed expressly teaches a uniform layer of building material as follows. Applicant’s specification recites “a computer software program that guides the supply unit that supplies the photo-activated building material that results in deposition of a desired thickness of the building material.” (Page 4, lines 15-20) (emphasis added). Thus, a layer of a single “desired thickness” is deposited. Such a layer is a “uniform” layer. Next, “the supply unit moves incrementally upward after application of each layer.” (Page 4, lines 24-25) (emphasis added). One of skill in the art would clearly understand that the supply unit is moved “incrementally upward” because each layer being applied is of a uniform thickness requiring the supply unit to then move “incrementally upward” before applying the next layer.

Finally, the specification as originally filed gives an express example of a deposited layer of building material having a single, uniform thickness. “For example, Shipley Microposit S1813 has a 12.3 micrometer thickness, requires 150 mJ/cm² for polymerization (“printing”), and may be polymerized at the G-line (0.54 NA).” (Page 5, lines 17-18).

Consequently, Applicant’s specification as originally filed would clearly have conveyed to one of skill in the art the deposition of a “uniform” layer of photo-activatable building material. Therefore, the rejection of claims 1-7, 22, 23 and 25-45 under 35 U.S.C. § 112, first paragraph, should be reconsidered and withdrawn.

Claim 45 was rejected under 35 U.S.C. § 112, second paragraph, due to a minor informality. Claim 45 has been reviewed in light of the Office Action and amended as necessary. Accordingly, the rejection of claim 45 should now be withdrawn and notice to that effect is respectfully requested.

With regard to the prior art, claims 1-5 and 22 were rejected under 35 U.S.C. § 103(a) as unpatentable in view of the combined teachings of U.S. Patent No. 5,303,141 to Batchelder, et al. ("Batchelder") and U.S. No. 5,980,812 to Lawton ("Lawton"). Claims 6, 7 and 23 were rejected under § 103 in view of the combined teachings of Batchelder, Lawton and U.S. Patent No. 6,214,276 to Gelbart ("Gelbart"). For at least the following reasons, these rejections are respectfully traversed.

Claim 1 recites

A method for fabricating an article using photo-activatable building material, comprising the steps of:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article; and

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning the layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated.

In contrast, neither Batchelder nor Lawton teaches or suggest "scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article" as claimed.

Batchelder teaches that an application of light, apparently from a single source, may be used to cure extruded material. However, "[o]ne requirement is that the selected material must cure before losing its extruded shape." (Batchelder, col. 7, lines 20-25). Thus, Batchelder does not teach or suggest "scanning" with a plurality of light-emitting centers or "selective" photo-activation of a layer of building material in accordance with an article being fabricated. Batchelder instead merely teaches exposing the entire extruded shape with a light source to cure the extrusion in the extruded shape.

Lawton teaches using a single light source with a scanning mirror to cure building material. (Lawton, col. 6, lines 52-54). Thus, Lawton also fails to teach scanning with "a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material" as claimed.

Thus, the combined teachings of Batchelder and Lawton fail to teach or suggest "scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article" as recited in claim 1. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). Therefore, the rejection of claims 1-7 should be reconsidered and withdrawn.

Claim 22 recites:

A method for fabricating an article using photo-activatable building material wherein light-emitting diode polymerization is utilized, comprising the steps of:

- laying down a uniform layer of photo-activated polymer with a thickness suitable for selective photo-activation;
- polymerizing a cross section of the article by selectively exposing the layer of photo-activated polymer to light;
- raising an applicator used to lay down said layer of photo-activated polymer;
- and
- repeating laying down layers and polymerizing a cross section of the article in each layer until the article is fabricated.

In contrast, neither Batchelder nor Lawton teach or suggest the combination of “laying down a uniform layer photo-activated polymer” and “raising an applicator used to lay down said layer of photo-activated polymer” as claimed.

Batchelder does not teach or suggest an applicator that lays down a uniform layer of building material. Rather, Batchelder teaches depositing successive drops of material, not a uniform layer.

Lawton teaches a doctor blade (104) that scraps building material into a recess in a piston (102). Thus, Lawton does not teach or suggest an applicator “used to lay down [a] layer” of building material that is then “raised” prior to deposition of the next layer.

Thus, the combined teachings of Batchelder and Lawton fail to teach or suggest “laying down a uniform layer photo-activated polymer” and “raising an applicator used to lay down said layer of photo-activated polymer” as claimed in claim 22. “To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).”

M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). Therefore, the rejection of claims 22, 23 and 25 should be reconsidered and withdrawn.

Claims 25-34 were rejected as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Batchelder, Lawton, Gelbart, U.S. Patent No. 5,764,263 to Lin "Lin" and U.S. Patent No. 4,029,006 to Mercer "Mercer." For at least the following reasons, this rejection is respectfully traversed.

Claim 26 recites:

A method for fabricating an article using photo-activatable building material, the method comprising:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article;

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;

curing the article in a curing oven following fabrication; and
automatically transporting the article between said applicator and said curing oven with a transport system.

As demonstrated above, Batchelder and Lawton fail to teach or suggest scanning a layer of building material with "a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material." The Office Action does not allege or suggest that Gelbart, Lin or Mercer teach or suggest the claimed scanning with a plurality of light-emitting centers. Therefore, the cited combination of prior art fails to teach or suggest at least the "scanning" element of claim 26.

Additionally, Lin is cited as teaching a transport system for transporting an article being fabricated "between said applicator and said curing oven." However, Lin does not

teach or suggest a transport system between an applicator and a curing oven in a system for fabricating an article. Lin teaches “[a] paper curl reduction process” in a printer. (Lin, Abstract). Applicant does not dispute that paper transport systems are known in printers. However, Lin does not teach or suggest the claimed “transporting the article between said applicator and said curing oven with a transport system.”

For at least these reasons, the cited combination of prior art fails to teach or suggest all the features of claim 26. Therefore, the rejection of claims 26-33 should be reconsidered and withdrawn.

Claim 34 recites:

A method for fabricating an article using photo-activatable building material, the method comprising:
depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;
scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article;
repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;
rinsing the article in a rinsing unit following fabrication; and
automatically transporting the article between said applicator and said rinsing unit with a transport system.

As demonstrated above, Batchelder and Lawton fail to teach or suggest scanning a layer of building material with “a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material.” The Office Action does not allege or suggest that Gelbart, Lin or Mercer teach or suggest the claimed scanning with a plurality of light-emitting centers. Therefore, the cited combination of prior art fails to teach or suggest at least the “scanning” element of claim 34.

Additionally, as demonstrated above, Lin does not teach or suggest a transport system between an applicator and a rinsing unit in a system for fabricating an article. Lin teaches “[a] paper curl reduction process” in a printer. (Lin, Abstract). Lin does not teach or suggest the claimed “transporting the article between said applicator and said rinsing unit with a transport system.”

For at least these reasons, the cited combination of prior art fails to teach or suggest all the features of claim 34. Therefore, the rejection of claim 34 should be reconsidered and withdrawn.

Claim 35 was rejected under 35 U.S.C. § 103(a) over the combined teachings of Batchelder, Lawton, U.S. Patent No. 6,126,884 to Kerekes et al. (“Kerekes”) and U.S. Patent No. 4,492,966 to Seki et al. (“Seki”). For at least the following reasons, this rejection is respectfully traversed.

Claim 35 recites:

A method for fabricating an article using photo-activatable building material, the method comprising:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article; and

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;

wherein said plurality of light-emitting centers are disposed in a modified inkjet print cartridge which is separate from said applicator.

As demonstrated above, Batchelder and Lawton fail to teach or suggest scanning a layer of building material with “a plurality of light-emitting centers to selectively photo-

activate the layer of photo-activatable building material.” The Office Action does not allege or suggest that Gelbart, Lin or Mercer teach or suggest the claimed scanning with a plurality of light-emitting centers. Therefore, the cited combination of prior art fails to teach or suggest at least the “scanning” element of claim 35.

Additionally, the cited prior art fails to teach or suggest “wherein said plurality of light-emitting centers are disposed in a modified inkjet print cartridge which is separate from said applicator.” Seki is cited by the final Office Action as teaching this subject matter. However, Seki does not teach or suggest a plurality of light-emitting centers in an inkjet print cartridge.

Seki teaches a carriage (CA) in a printing device that is used to both print and optically scan printed material. Consequently, the carriage may include an inkjet printhead. (Seki, col. 22, lines 7-11). Additionally, the carriage includes a scanning unit comprising LEDs (LE1-LE4) to illuminate the printed material and photosensor elements (CD1-CD8) to optically scan the illuminated printing. (Seki, col. 21, lines 50-56). Thus, the inkjet printhead is separate from the LEDs of the scanning unit, although both are mounted on the same carriage. Consequently, Seki fails to teach or suggest a “plurality of light-emitting centers are disposed in a modified inkjet print cartridge which is separate from said applicator.” (Emphasis added).

For at least these reasons, the cited combination of prior art fails to teach or suggest all the features of claim 35. Therefore, the rejection of claims 35 and 37-45 should be reconsidered and withdrawn.

In addition to the independent claims discussed above, the various dependent claims in the application also recite subject matter that is not taught or suggested by the prior art of record.

For example, claim 3 recites: "wherein scanning is accomplished using a modified printing cartridge that includes, located at an orifice plate, at least one of: light focusing devices and light baffling devices." Similarly, claim 29 recites: "wherein scanning is accomplished using a modified printing cartridge that includes light directing devices located in an orifice plate."

In contrast, the final Office Action fails to indicate how or where the cited prior art teaches a printing cartridge with light focusing or baffling devices located **at** an orifice plate or light directing devices located **in** an orifice plate. Actually, this subject matter is not taught or suggested by the prior art of record.

Claim 4 recites: "wherein the light focusing devices include lenses at nozzle locations and wherein the lenses are set at predetermined distances from the light-emitting centers." Similarly, claim 30 recites: "wherein the light directing devices include lenses at nozzle locations and wherein the lenses are set at predetermined distances from the light-emitting centers." Again, the final Office Action does not indicate how or where this subject matter is taught in the cited prior art references.

Claim 5 recites: "wherein depositing a layer of the photo-activatable building material is accomplished by one of: silk-screening, spraying, or spinning the building material in a manner that deposits a uniform layer of the building material onto the preselected surface." Similar subject matter is recited in claims 31 and 41.

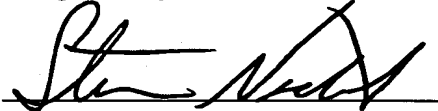
In contrast, Batchelder teaches depositing beads of material, while Lawton teaches scraping material with a doctor blade. The final Office Action fails to indicate how or where

the prior art teaches depositing a uniform layer using any of the methods listed in claims 5, 31 and 41.

For any and all of these additional reasons, these various dependent claims are further patentable over the prior art of record. Notice to this effect is respectfully requested.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,



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